



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,335	05/15/2006	Yuji Itoh	Q94902	1873
<div>23373 7590 12/12/2007</div> <div>SUGHRUE MION, PLLC</div> <div>2100 PENNSYLVANIA AVENUE, N.W.</div> <div>SUITE 800</div> <div>WASHINGTON, DC 20037</div>				
<div>EXAMINER</div> <div>ASDJODI, MOHAMMAD REZA</div>				
<div>ART UNIT PAPER NUMBER</div> <div>1796</div>				
<div>MAIL DATE DELIVERY MODE</div> <div>12/12/2007 PAPER</div>				

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/579,335

Applicant(s)

ITOH ET AL.

Examiner

Asdjodi M. Reza

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 05/15/2006.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-26, and 29-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shroeder et al. (US 2003/0124959 A1) in view of Ando et al. (US 2003/0004085).

Regarding claims 1-4, Shroeder et al. teach a composition for copper chemical and mechanical polishing (CMP) using a polymeric complexing agent to provide a planarized surface; [¶.0005, 0046]) comprising; water; [¶.0007] an acidic, and oxidizing etchant (hydrogen peroxide); [¶.0013, 0097], and phosphates; [¶.0012], wherein the pH is in the range of 2-9; [¶.0047].

Shroeder et al. does not explicitly teach phosphate esters of C_6 - C_{22} , but teach that phosphate and sulfonic acid surfactant are substantially functional equivalents. However, Ando et al. teach a composition for removing polishing material of CMP from a polishing pad. Ando et al.'s composition, similarly, comprises surfactants, acids and ester phosphates by the amount of 0.1 to 20%; [¶.0044, 0045]. Shroeder et al. and Ando et al. are analogous (or combinable) art because they are from the same field of endeavour, that surface polishing compositions and removing the same from a surface. At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the phosphate ester of Ando et al. with polishing composition of Shroeder et al. These surfactants are equivalent alternatives therefore the motivation would have been to make a polishing composition with an improved characteristics such as stability, miscibility, and boundary improved lubrication property.

Regarding claims 5, 6, 19, 20, 22, and 23, Shroeder et al. teach a composition comprising acid and base in the range of 0.7%; [¶.0044], [0097], hydrogen peroxide as oxidizing agent by the amount of 3%; [¶.0013, ¶.0014, 0018], acids such as phosphonic acid; [¶.0012], and a base such as ethylenediamin; [¶.0097].

Regarding claims, 7-8, and 24, Shroeder et al. teach a composition comprising an abrasive by the amount of 0.1 to 20%; [¶.0032], wherein the abrasive is aluminum oxide; [¶.0044].

Regarding claims, 9-10, 25 and 26, Shroeder et al. teach a composition comprising a surfactant by the amount of 1%; [¶.0052], wherein the surfactant is polystyrenesulfonic acid; [¶.0014].

Shroeder et al. does not teach the amount of surfactant in the range of 5%.

The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. *In re Aller*, 105 USPQ 233. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to optimize the amount of surfactant in the polishing composition. Motivation would have been to minimizing the dishing of copper during the polishing process. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. *In re Boesch and Slaney*, 205 USPQ 215.

Regarding claims, 11-12, 15-16, and 30, Shroeder et al. teach a polishing composition comprising a compound with one or more azole moieties, such as 1,2,4, triazole, by the amount of 0.0001 to 2%; [¶.0051].

Regarding claims, 13, 14, and 29, Shroeder et al. teach presence of glycine as amino acid by the amount of 0.75w%; [¶.0079].

Regarding claims 17 and 18, Shroeder et al. teach presence of polymeric carboxylic acid (fatty acid) as polymeric complexing agent by the amount of 0.5 to 2w%; [¶.0038].

Regarding claims 31, 32, 37 and 38, Shroeder et al. teach mixing of a solution of polishing composition which can be stored for future use; [¶.0059, 0060].

Regarding claims 33, 34, 35 and 36, Shroeder et al. teach a method and a polishing composition (a kit) that is capable of polishing and planarizing surfaces containing copper, tantalum layers; [¶.0093].

Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shroeder et al. (US 2003/0124959 A1) in view of Ando et al. (US 2003/0004085), as applied to claims 12, 11, and 1 above, and further in view of Singh (US 2003/0162399 A1).

Regarding claims 27 and 28, Shroeder et al. does not explicitly teach presence of vinyl group in the polymer with average molecular mass of 2000 to 500000. However Singh teaches a polishing composition (CMP) comprising an imidazoline carboxylate polymer with molecular weight of approximately 15000; [¶.0096]. Shroeder et al. and Singh are analogous (or combinable) art because they are from the same field of endeavour, that of surface polishing compositions. At the time of invention, it would have been obvious to a person of ordinary skill in the art to combine the phosphate ester of Singh with polishing composition of Shroeder et al. The motivation would have been to make a polishing composition with an improved characteristics such

Application/Control Number:
10/579,335
Art Unit: 1796

Page 6

as stability in liquid phase (due to vinyl groups), low volatility, and high lubrication property.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Reza Asdjodi whose telephone number is 571-270-3295. The examiner can normally be reached on Monday-Friday 8:00-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M. Reza Asdjodi
11/06/2007



MARK EASHOO, PH.D.
SUPERVISORY PATENT EXAMINER

10/Dec/07